after the current ceases, and till the keeper is raised, varies; above it, it is constant.

The paper concludes with a summary of its contents and those of the two preceding it.

A perfect copy of Charles Brooking's map of Dublin, published in 1728, with a view of the city, and fronts of the public buildings, was presented by Miss Wilkinson.

A list of donations of books presented was read, and thanks voted to the donors.

MONDAY, DECEMBER 14, 1857.

JAMES HENTHORN TODD, D. D., President, in the Chair.

The Rev. Robert Carmichael read a Paper on the Singular Solutions of Partial Differential Equations.

William Kelly, M. D., R. N., read the following Paper on—

THE ANNUAL VARIATIONS OF ATMOSPHERIC PRESSURE IN THE GULF OF ST. LAWRENCE.

The Table which accompanies this Paper is an abstract from the "Meteorological Journal of the Naval Surveying Party" on the St. Lawrence. The observations from which it is taken extend over nine years, from 1841 to 1850. They were made on board the Gulnare surveying vessel, from the end of May in each year, to the middle of October; and during the remainder of the year at Charlotte Town, Prince Edward Island, where the party wintered.

Two ordinary marine barometers were employed in making these observations. The first got out of order in June, 1845, and the second was not obtained until the September following. The indications of the latter were somewhat lower than those of the first, which agreed generally with other barometers of the same construction. There was no apparent difference, however, in the range of the instruments, which, it is scarcely necessary to say, was less than the true range; not only on account of the varying level of the mercury in the bag, according as it ascends or descends in the tube; but also from hygrometric causes acting on the bag itself; the instruments having been kept in the moist air of a vessel at sea during the summer, and in the dry air of a house warmed by stoves during the winter.

From the mean of all the observations we find that the atmospheric pressure is least in January, February, and March; that it increases slowly in April and May, and that there is a very slight decrease (·01) in June; that the pressure is greatest in July, August, and September, after which it decreases gradually through the three remaining months of the year.

The annual course of atmospheric pressure which we find here, on the north-east coast of America, derives interest from the fact that a similar

course has been as yet observed only at Sitka, on the extreme north-west of the continent, and in Europe at considerable mountain elevations. Nothing apparently connected with it, either by similarity or contrast, has been observed on the mainland of North America; but in the sea to the north of the continent, which in following the coast-line may be said to lie between Norfolk Sound and the Gulf of St. Lawrence, we find an annual course of atmospheric pressure, decidedly different from that which obtains in these seas.

Summary of Barometric Observations made in Charlotte Town, and the southern parts of the Gulf of St. Lawrence, between 1841 *and* 1850.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1841						29·964	29·958	30·115	30·044	29·837	29·729	29·816
1842	29·789	29·838	29·899	29·895	29·842	29·986	30·044	30·172	29·943	29·899	29·852	29·853
1843	29·946	29·725	29·663	29·927	29·977	29·900	29·960	30·120	30·020	29·843	29·857	29·920
1844	29·657	29·928	29·923	30·070	29·927	29·970	29·933	30·036	30·063	29·985	29·800	29·777
1845	29·894	29·856	29·895	29·900	29·944	. . .	. . .	. . .	29·790	29·983	29·695	29·712
1846	29·568	29·590	29·716	29·776	29·736	29·808	29·750	29·817	29·803	29·873	29·704	29·510
1847	29·610	29·623	29·520	29·593	29·790	29·847	29·903	29·959	20·883	29·821	29·764	29·774
1848	29.820	29·485	29·682	29·782	29·704	29·773	29·909	29·910	29·802	29·783	29·765	29·784
1849	29·617	29·887	29·813	29·588	29·817	29·769	29·872	29·892	22·975	29·820	29·690	29·590
1850	29·730	29·560	29·470	29·590	29·720	29·748	29·797	29·724	29·791			
Means	29·737	29·722	29·725	29·791	29·829	29·863	29·903	29·972	29·901	29·872	29·762	29·748

Mean of all the Observations reduced to the Level of the Sea.

Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
29·781	29·766	29·769	29·835	29·873	29·863	29·903	29·972	29·901	29·894	29·806	29·792

From the observations carried on for three years, on board H. M. S. Investigator, in Melville Sound, and those of Captain Parry, at Melville Island, we find that the barometer was always lowest in July, August, and September; and comparatively high, although not highest, in January, February, and March. The low state of the barometer in the former months was marked in all Parry's voyages; but from his observations, as well as from those made in the Investigator, the greatest height was in April and May.

It would seem that the annual course of atmospheric pressure, which prevails all over Asia (and which is the reverse of that observed in the Gulf of S. Lawrence), extends beyond the shores of Siberia, and is met in a modified form, on the American side of the Arctic Sea.

The President read a letter addressed to him by the Baron de Bonstettin, containing inquiries respecting ancient pipes discovered in excavations in Ireland.

The following antiquities were presented to the Museum:—

1. An iron spear-head found in the county of Fermanagh. Presented by Miss Richardson.
2. A small cinerary urn, found near Cabinteely, on the land of the donor. It was discovered in the centre of a small chamber filled with a mixture of clay and bone-dust, and covered with a large flag, and about two feet of earth. Presented by J. H. Jessop, Esq.
3. A small glass bottle, found in Ardglass, county of Down. Presented by Rev. J. H. Todd, D. D., President.
4. Five modern Indian coins, and a small ingot of silver. Presented by William Kennedy, Esq.
5. Several copies of the new Index to the Ordnance Map of Ireland, on the scale of one inch to the statute mile, showing the state of publication on the 30th of November, 1857. Presented by Captain Leach.

MONDAY, JANUARY 11, 1858.

HUMPHREY LLOYD, D.D., Vice-President, in the Chair.

ALEXANDER T. BLAKELEY, Esq.; Maurice Henry Collis, M.B.; Howard B. Montgomery, M.D.; and John Purser, Jun., Esq.; were elected Members of the Academy.

The REV. DR. LLOYD read a paper—

ON THE DETERMINATION OF THE INTENSITY OF THE EARTH'S MAGNETIC FORCE IN ABSOLUTE MEASURE, BY MEANS OF THE DIP CIRCLE.

THE received method of determining the intensity of the earth's magnetic force is unsuited to the high magnetic latitudes, the error of the deduced force, arising from a given error of inclination, becoming very considerable when the latter approaches to 90°. To remedy this defect the author suggested, some years since,* another process, in which the total intensity is found *directly* by means of the dip circle,—the *product* of the earth's magnetic force into the magnetic moment of the magnet being determined by the position of equilibrium of the dipping-needle, when loaded with a small weight, and the *ratio* of the same quantities being found by removing the needle, and employing it to deflect another substituted in its place. Subsequent considerations, however, led him to propose that the dip-circle should be employed only in the *latter* part of the process, and that the observation should be completed by the known method.

* See "Proceedings," January 24, 1848.